

(c) Settleable Solids

An effluent limitation for Settleable Solids (SS) was included as a state certification requirement in the existing permit. However, the NHDES-WD requests omitting this requirement because the SS test results are uncertain and the TSS test provides the necessary data (TSS is a more appropriate measure of the solids content of the effluent). Therefore, an effluent limit for SS is not included in the draft permit.

(d) Total Residual Chlorine

Total Residual Chlorine (TRC) was limited by a narrative statement in the existing permit (i.e., there were no numerical limits). The narrative requirements were based upon a state certification requirement. TRC limits in the draft permit are based on available dilution and the State's acute and chronic water-quality standards. These limits are derived as follows:

$$\text{Effluent Limit} = (\text{Dilution Factor}) \times (\text{Water-Quality Standard})$$

$$\text{Average Monthly Limit} = 177 \times 7.5 \mu\text{g/L} = 1328 \mu\text{g/L} = 1.33 \text{ mg/L}$$

$$\text{Maximum Daily Limit} = 177 \times 13 \mu\text{g/L} = 2301 \mu\text{g/L} = 2.3 \text{ mg/L}$$

(e) BOD₅ and TSS

The regulations at 40 CFR Section 125.60(a) require that a 301(h) waiver facility achieve at least primary or equivalent treatment of its effluent. Primary or equivalent treatment is defined as treatment adequate to remove at least 30 percent of the biochemical oxygen demanding (BOD₅) material and 30 percent of the total suspended solids (TSS) from the influent (see 40 CFR Section 125.58(r)). Accordingly, the draft permit requires at least 30 percent removal of both BOD₅ and TSS, based upon a monthly average (see 40 CFR 125.60(b)).

The draft permit also limits the concentration and the mass of BOD₅ and TSS that may be discharged from the treatment works. The following paragraphs discuss the derivation of these limits.

The City of Portsmouth based its 301(h) application on plant performance data. EPA has reviewed Portsmouth's plant performance data from 1/02 -12/04. EPA has determined, based on this performance, that the TSS mass load can be lowered from the existing permit's TSS limit of 4691 lbs/day to 3824 lbs/day.. The draft permit's TSS limit was derived using the statistical methodology found in Appendix E of EPA's "Technical Support Document for Water Quality-Based

Toxics Control." (March 1991).

The average monthly limit value of 3824 lbs/day represents the 95 percentile of the distribution of the averages of the daily values, assuming a lognormal distribution of the data. The details of the statistical analysis supporting this limit are contained in Attachment G to this Fact Sheet. The TSS concentration limit can be derived using the new mass limit and the updated plant design flow. See below:

$$\text{MASS LIMIT}/(\text{CONVERSION} \times \text{DESIGN FLOW}) = \text{CONCENTRATION}$$

$$3824 \text{ lbs/day} / (4.8 \text{ mgd} \times 8.34 \text{ (lbs/MG)/(mg/l)}) = 95 \text{ mg/l}$$

EPA performed a similar statistical analysis to derive a monthly average BOD₅ limit. The results indicate that the average monthly limit for BOD₅ could be set at 167 mg/l for this plant. This concentration is higher than the concentration limit in the existing permit and may be allowed under antibacksliding (new information and material and substantial alterations to the plant). However, the implementing regulation for Section 301(h) of the CWA prohibit any new or substantially increased discharges of the pollutant to which the modification applies (see 40 CFR § 125.67(a)). EPA believes that allowing an increase of BOD₅ concentration to 167 mg/l from 150 mg/l together with an increase of the design flow to 4.8 mgd from 4.5 mgd would in fact result in a substantial increase of this pollutant (approximately 19 percent increase). Therefore, no increase in the concentration of BOD₅ is allowed in the permit. The small increase in design flow has been used to derive the mass BOD₅ limit. EPA does not view this slight increase in mass load as substantial.

The derivation of the mass BOD₅ load is shown below:

$$4.8 \text{ mgd} \times 150 \text{ mg/l} \times 8.34 \text{ (lbs/MG)/(mg/l)} = 6005 \text{ lbs/day}$$

Since the mass loading represents a slight increase in the discharge of pollutants, the State's antidegradation requirements must be met. Region I has discussed this increase in BOD₅ with the NH DES and has determined that antidegradation requirements have been satisfied. This determination is based on the insignificant impact to the receiving water expected from the slightly higher BOD₅ limit.

The draft permit's BOD₅ and TSS sampling frequencies are specified as two times per week to conform to the EPA Region I and NHDES effluent monitoring guidance dated July 1999. This is an increase over the once per week requirement found in the existing permit.

(f) Bacteria

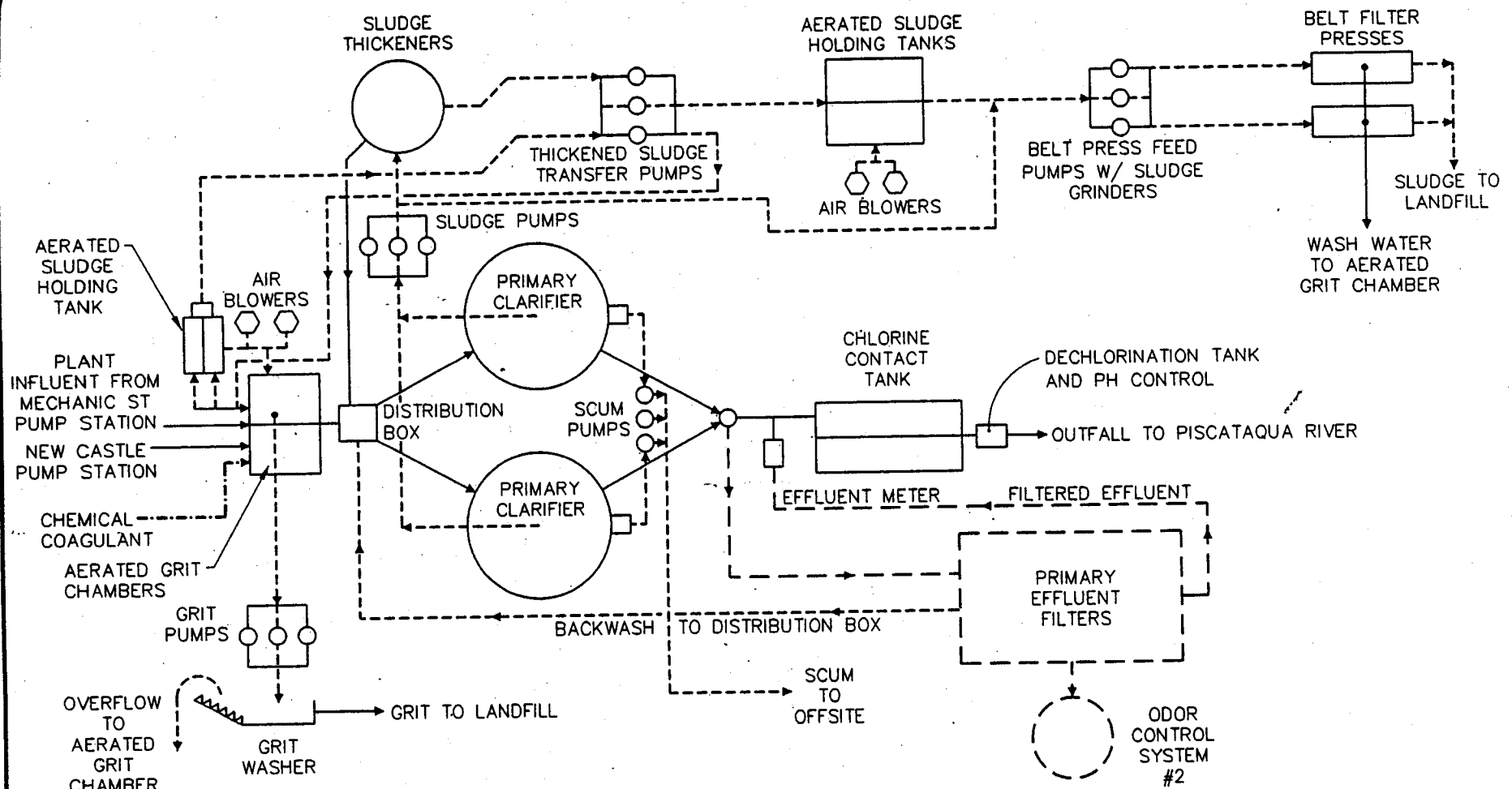
The limit for Fecal Coliform bacteria is new to this draft permit and replaces the Total Coliform bacteria limit in the existing permit. This limit is based on state water quality requirements.

New Hampshire State statute N.H. RSA 485-A:8,V. specifies that the bacteria standard shall be "... as recommended under the National Shellfish Program Manual of Operation, United States Department of Food and Drug Administration." This standard applies to facilities which discharge into tidal waters used for growing or taking of shellfish for human consumption, and therefore applies to Portsmouth's WWTF. The recommended criteria for Fecal Coliform Bacteria is 14 colonies per 100 milliliters of Fecal Coliform Bacteria and includes a condition that "... not more than 10 percent of the collected samples to exceed a Most Probable Number (MPN) of 43 per 100 milliliters for a 5-tube decimal dilution test." The NHDES-WD has determined that the Fecal Coliform value of 14 colonies per 100 milliliters applies to NPDES permits as an "average monthly" limit and that permits should also include a maximum daily "report only" requirement. The report only requirement is needed to monitor the variation in Fecal data to properly assess compliance with the "average monthly" limit (i.e., ensure not more than 10 percent of the samples exceed the MPN). The average monthly bacteria limit is determined by calculating the geometric mean of the daily sample values.

Since the NHDES-WD has determined how the Fecal Coliform criteria shall be applied in NPDES permits for conformance with N.H. RSA 485-A:8,V. and has designated the average monthly "limit" and the maximum daily "report-only" requirement as state certification requirements, this is considered "New Information" by the Agency. "New Information" is considered under Section 402(o)(2) of the ACT as one of the specific exceptions to the general prohibition against establishing less stringent effluent limitations. Therefore, antibacksliding requirements have been satisfied.

Finally, a change from Total to Fecal Coliform in this draft permit will make the effluent testing requirements consistent with the draft permit's ambient water quality monitoring program testing requirement (see draft permit Part I.B, "BIOLOGICAL AND WATER QUALITY MONITORING PROGRAM" and see Section D.2.(i) of this Fact Sheet (below) for additional information on this program).

N.H. RSA 485-A:8,V. also requires enterococci bacteria limits for discharges to "tidal waters utilized for swimming purposes." However, EPA is not requiring a numerical enterococci bacteria limit in this permit. Rather, EPA is imposing a



Chemically Enhanced Primary Treatment Facility Layout

H:\SDSKPROJ\966\966schem04.dwg

DATE
MAY 04PROJECT
966-01EUnderwood
Engineers, Inc.PEIRCE ISLAND WWTP
Portsmouth, NH

FIGURE

1